



SOLAR ENERGY

AND THE THREAT TO FOOD SECURITY

John Constable

Solar Energy and the Threat to Food Security

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About the author

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Preface to the 2022 edition

This document was first released on 30 May 2021. It has been updated in January 2022 to reflect the rapid growth in applications for large solar installations over the last eight months. When the first edition of this study was published, it was thought that there were around 8 GW of solar capacity in various stages of development, with new capacity entering planning at the rate of about 500 MW a month. This has proved to be an underestimate. The solar industry has recently (January 2022) disclosed that it believes there is some 37 GW of solar capacity in various stages of planning, which would entail an approximate land take of 150,000 acres.¹

The scale of the threat to British food supply from unrestrained solar development has grown and the reforms to planning guidance recommended in the paper are now urgently required.



Introduction

A key planning guidance document relating to farmland and energy projects, National Policy Statement EN-1 (2011), is out-dated and needs revision to protect the public interest. This revision should discourage speculative conversion of productive agricultural land to solar generation as a preliminary to other industrial and commercial development. Such conversion has already been observed on a very large scale (thousands of acres per site).

The guidance in EN-1 is not just weak, but actively prevents decision-makers from giving the value of standard and poorer land (Grades 3b and below in the official Agricultural Land Classification system) any significant weight in the planning balance, when in fact it is valuable for reasons of food security. This document further notes active planning proposals exploiting the loophole, comments on the public interest in the land lost to agriculture and suggests a revision to planning guidance to deal with the matter.

Details

Decision-makers in the planning system rely on advice contained in National Policy Statements (NPS). In relation to energy, there are six of these documents, introduced on 19 July 2011:²

- EN-1 (Overarching Energy Strategy)
- EN-2 (Fossil Fuels)
- EN-3 (Renewable Energy)
- EN-4 (Oil and Gas Supply and Storage)
- EN-5 (Electricity Networks)
- EN-6 (Nuclear Power).

While the age of this guidance suggests that a general review would be timely, we shall here concentrate on one matter only: a problematic paragraph in EN-1, which offers a loophole for speculative developers to use solar applications to secure change of land use from agricultural to industrial, and to do so on a very large scale. This loophole is being exploited in the wild, and should be closed as soon as possible. The relevant text is:

5.10.15: The [decision-maker] should ensure that applicants do not site their scheme on the best and most versatile agricultural land without justification. It should give little weight to the loss of poorer quality agricultural land (in grades 3b, 4 and 5), except in areas (such as uplands) where particular agricultural practices may themselves contribute to the quality and character of the environment or the local economy.

This wording affords little protection even to better grades of land, and all but completely removes protection from the everyday Grades of 3b and below.

EN-1 is currently being revised, but this paragraph, now numbered 5.11.14, is unchanged in the current draft dated September 2021.³ This is to some degree inconsistent with the

guidance given elsewhere in the document, for example in 5.11.8, where the government writes:

5.11.8 Applicants should seek to minimise impacts on the best and most versatile agricultural land (defined as land in grades 1, 2 and 3a of the Agricultural Land Classification) and preferably use land in areas of poorer quality (grades 3b, 4 and 5) except where this would be inconsistent with other sustainability considerations.⁴

The approach taken in 2011 is to a degree understandable; but the failure adequately to revise the guidance in the light of current circumstances is negligent. Government recognises, in 5.11.8, that other sustainability considerations, such as food security, are relevant, but has not given decision makers sufficient leeway to protect the national and public interests.

The dated character of EN-1 is obvious. At the time of EN-1s' initial publication in 2010/11, a large solar site, for example, would have comprised under 30 acres, and before then the maximum installed capacity was approximately 5 MW, the ceiling for the Feed-in Tariffs, through which almost all solar developers sought support. The authors of the document would probably have felt that small parcels of land, even of better quality, could reasonably be used for energy generation.

But since publication of EN-1, landowners and their agents have been actively exploiting the opportunity it presents, and the largest operational site is now of 72 MW, implying a land take of approximately 300 acres (3–5 acres per megawatt of capacity is a reasonable rule of thumb; unless precise numbers are known, land estimates below are based on 4 acres per megawatt). There is a strong suspicion that the principal commercial motivation for such schemes is that of the landowner, who achieves the conversion of a large parcel of agricultural land to industrial status, opening it up for flexible commercial development in the future, after the solar scheme is decommissioned in whole or in part.

The problem is not yet appreciated by government, though well understood by land-use specialists and those with first-hand experience. Recent parliamentary questions put to ministers have revealed that BEIS does not keep track of the issue:⁵ when asked in December 2020 what estimates the department had made of solar development on land of various agricultural grades, both consented and in process, Mr Kwarteng, then Minister of State for Energy, replied that 'We have not made any estimate'.

It is not difficult, however, to find sufficient information in the public domain to form a view of the order of magnitude of the development pipeline. When the first edition of this document was released, there were four major schemes listed on the National Infrastructure Planning website: Cleve Hill, Sunnica, Little Crow, and Longfield. There are now at least ten in total, although some may not include the term 'solar' in their project name, for example Sunnica. These are only the larger of the schemes extant in the UK. Many are below the 50 MW threshold and are therefore visible only in the Town and Country Planning system, for which

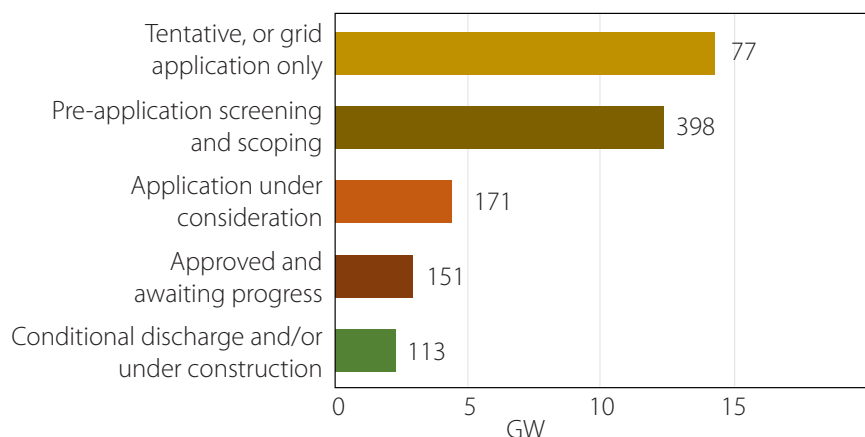
there is no reliable central record, the Government's Renewable Energy Planning Database (REPD) being notoriously incomplete in its coverage.⁶ Examples of large-scale solar include:

- the consented 890-acre (350 MW) Cleve Hill Solar Park project on grazing marsh in Kent;⁷
- the approximately 2,400 acre (600 MW) Cottam Solar Project on the Lincolnshire/Nottinghamshire border;⁸
- the approximately 2,000 acre (500 MW) Heckington Fen in Lincolnshire;⁹
- the approximately 600 acres (150 MW) Little Crow project near Scunthorpe;¹⁰
- the approximately 1,400 acre (350 MW) Longfield scheme near Chelmsford in Essex;¹¹
- the 2,175 acres (350 MW) Mallard Pass Solar Project of on the Lincolnshire/Rutland border;¹²
- the 650 acre (163 MW) Oaklands Farm Solar Project in Derbyshire;¹³
- the 400 acre (165 MW) Stonestreet Green Solar, near Ashford in Kent;¹⁴
- the approximately 2,800 acre (500 MW) Sunnica proposal near Newmarket in Suffolk;¹⁵
- the 1,900 acre (480 MW) West Burton Solar Project on the Lincolnshire/Nottinghamshire border.¹⁶

Apart from these readily visible schemes, there is a larger pipeline of projects in development, which are not yet easily detected. Solar industry analysts have been reporting a significant rise in activity over the last few years. The *Solar Power Portal*, an online trade journal for the industry, which first drew attention to this phenomenon in November 2020,¹⁷ has recently reported that solar developments in planning now total some 37 GW of capacity.¹⁸ This would require approximately 150,000 acres of land for construction, assuming 4 acres per megawatt. Solar Power Portal's helpful graphic, reproduced here as Figure 1, summarises the state of the development pipeline.

Figure 1: UK ground-mounted PV pipeline, capacity and number of projects in January 2022

Redrawn from the figure published by Solar Power Portal.²⁰



Of the 37 GW, about 10 GW is either submitted to the planning system and under consideration or is under or awaiting construction (the three lower bars in the figure). This is consistent with the data found in the government’s Renewable Energy Planning Database (REPD), which reports about 8.7 GW of solar capacity in the same phase. Solar Power Portal’s data regarding projects in the very early, tentative, stages, or in screening and scoping, is not found elsewhere, and is highly significant, comprising some 27 GW of capacity at approximately 475 sites.

Additional data published by Solar Power Portal’s parent, Solar Media Ltd as part of an advertisement for data available on commercial terms, reveals the acceleration in the development pipeline (Figures 2 and 3). Note that these two freely available figures refer to the ‘planned’ capacity of 21 GW visible in September 2021, with the more recent sites bringing the total up to 37 GW presumably available only to paying clients. Nevertheless, the quantity and rate of growth is clear and remarkable.

While it is true that not all of these schemes will proceed to application, it must be assumed that this intensity of preliminary interest will result in a very large capacity entering the planning system’s formal screening and scoping stages, with considerable number ultimately making applications for planning consent. Solar Power Portal estimates that only 10% of the projects at the tentative stage will proceed, but it would be a mistake to take comfort from this es-

Figure 2: New large-scale ground-mounted solar PV pipeline capacity January 2019 to August 2021.
Redrawn from a Solar Media Ltd chart.²¹

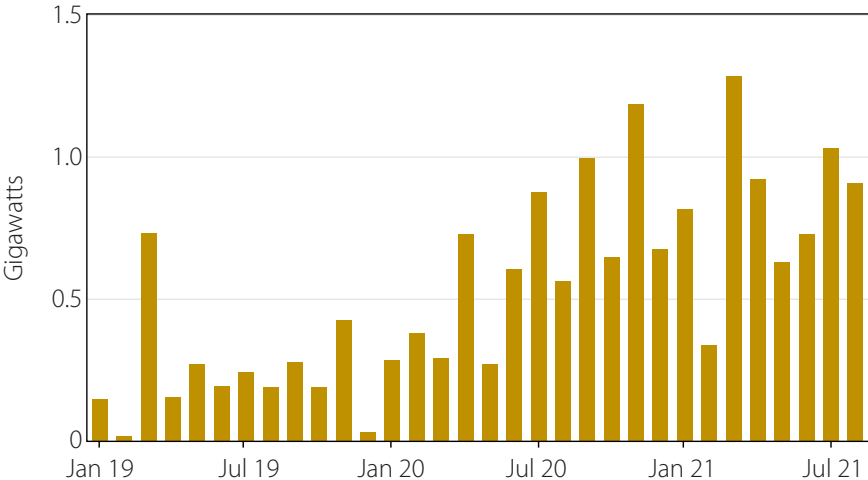
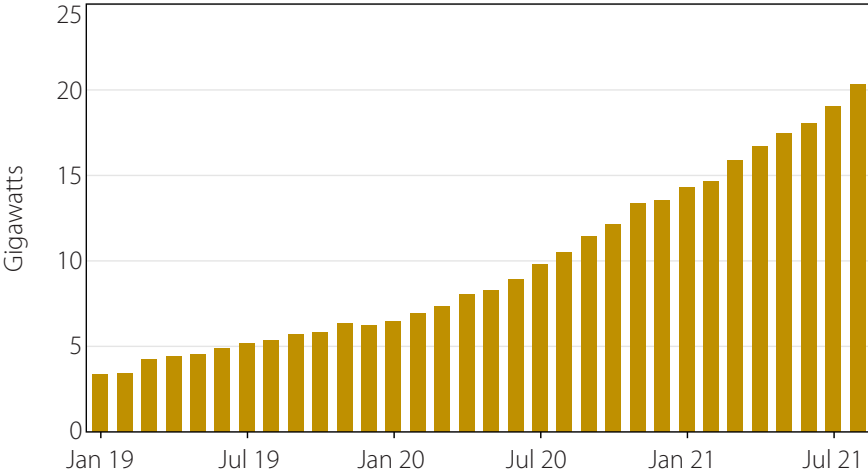


Figure 3: Cumulative ground-mounted solar PV capacity, January 2019 to September 2021.
Redrawn from a Solar Media Ltd chart.²²



timate when so much farmland is at stake, and when the planning guidance is so weak.

As already noted, some 150,000 acres is earmarked for solar development, a figure that is striking in itself but extremely alarming when put into the context and seen as part of a long-term trend and increasing loss of farmland to other development pressures, as spelled out in the following section.

Is agricultural land loss significant?

It should be noted at the outset that land in Grade 3b (and below) is not worthless. It is defined as being capable of producing moderate yields, especially of cereals. It can produce high yields of grass, and in some areas may be ideal for specialist root crops. Good agricultural practice can make Grade 3b land more productive. Even Grade 4 land can be valuable for grass and occasional arable crops, for example cereals and forage crops; where land has been graded as 4 because it is dry, irrigation provides a ready remedy.

The loss of such agricultural land on the scales described above, with some 30,000 acres or more currently facing proposals for solar photovoltaic, adds to the existing trend to withdraw land from agricultural production. The UK currently has approximately 14.8 million acres of arable land, the lowest level since 1945. In the decade 2009–2019, the arable area fell by about 740,000 acres, and the area of land lost to agriculture currently stands at about 99,000 acres per year. The area facing solar development is a highly significant increment to an already undesirable trend.

The UK is approximately 61% self-sufficient in food production, and 75% self-sufficient in indigenous food types. However, this relatively reassuring picture is put into doubt by the decline in agricultural area under cultivation and by population growth, which adds approximately 400,000 people to feed each year. On these assumptions, within twenty years the UK will be feeding a population that is considerably larger, but from an arable land base that has shrunk by 13%. This would imply an import dependency of about 50% or more.

It is also true that while some of the impacts of climate change on agricultural productivity will be positive, some will not. It is estimated in the Energy White Paper, for example, that even if there are no further temperature increases, some 15% of the UK's land resource will be classified as poor, and even if the Paris Agreement objective of restricting temperature rises to 1.5°C is achieved, food production will still be reduced. Given global population growth and climate change impacts, imports to supply falling production in the UK cannot be guaranteed.

The obvious conclusion is that it would be prudent for the UK to at least maintain current levels of land under cultivation, and probably to increase it. Conversion of agricultural land to solar photovoltaic generation on the scales described above is not in the public interest; it is therefore a matter of pressing concern that the planning guidance available to decision-makers does not correctly reflect the value of agricultural land.

Government review of planning guidance

The *Energy White Paper* published on 14 December 2020 contains important information relevant to planning guidance and promises a review of the National Policy Statements.¹⁹ This review could address the solar loophole identified above, and allow decision-makers to give appropriate weight to agricultural land of ordinary, but still important, quality. However, the timetable outlined in the white paper is not sufficiently rapid to provide prompt assistance. Many of the projects described above would require decisions before the revised guidance became relevant, and much land could be lost to agricultural use, with corresponding harm to the public interest.

Recommendation

In the interim, one possible way of obtaining a timely correction to the obsolete guidance would be for the BEIS to issue a written ministerial statement, or similar intervention, ahead of the formal review of planning guidance, to compel decision-makers to give proper weight to all land grades in the planning system.

Further legal advice should be taken as to how to revise the advice in EN-1 so that decision-makers can give appropriate weight to the value of even lower grades of land, bearing in mind that such land can be more valuable for certain purposes than high-grade land. As noted above, the current draft's paragraph 5.11.8 does recognise that "other sustainability considerations" are affected detrimentally by land use for renewable energy, and that renewable energy should not have a presumption in favour precedence, but the current draft's 5.11.14, which replicates 5.10.15 in the original document creates exactly that undesirable situation. The guidance needs to be reformed to create a presumption against the use of agricultural land of any grade, putting the burden of proof on the developers of the renewable energy scheme. As a draft recommendation, the following text may be suggested as a revision to paragraph 5.10.15/5.11.14:

The [decision-maker] should ensure that applicants do not site their scheme on agricultural land, of any Agricultural Land Classification grade, without adequate justification, bearing in mind the importance of domestic food production both in the context of climate change and leaving the European Union. It should give appropriate weight even to the loss of agricultural land in Grades 3b, 4 and 5, bearing in mind that such land is particularly suitable for certain agricultural practices that may themselves contribute to the quality and character of the environment and the local and national economies.

Notes

1. https://www.solarpowerportal.co.uk/news/meteoric_growth_in_new_solar_farm_planning_in_uk_sees_pipeline_reach_a_stag.
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